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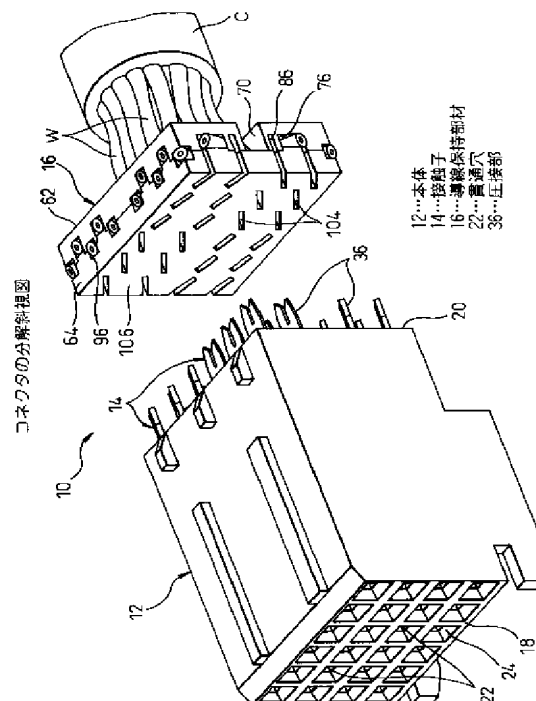
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(54)【発明の名称】 高密度接続用コネクタ及びこのコネクタに使用される接触子

(57)【要約】

【課題】 同一長さの全ての接触子に複数のケーブル導線を一括して圧接でき、圧接部や導線への外力の影響を回避できる高密度接続用コネクタを提供する。

【解決手段】 コネクタ10は、本体12の方形格子状配置の複数の貫通穴22に収容された複数の接触子14と、ケーブルCの複数の被覆導線Wを分離保持する導線保持部材16とを備える。接触子14の一端の圧接部36は、接触子14の軸線の周りで所望角度に回転して、本体12の後端面20から突設される。導線保持部材16は、第1保持板62と第2保持板64とを相互に組合せて構成される。第1保持板62の複数の第1挟持条部76と第2保持板64の複数の第2挟持条部96との間に複数の被覆導線Wを絶縁挟持した導線保持部材16を、複数の接触子14の圧接部36を複数の第2切込104に挿入しつつ本体12の後端面20に取付けると、各圧接部36が各被覆導線Wに一括して圧接される。



【特許請求の範囲】

【請求項1】 一对の対向端面間に延びる複数の貫通穴を相互に略平行に方形格子状配置で備えた電気絶縁性の本体と、電線を圧接する圧接部を各々の一端に備え、該圧接部を該本体の一端面から突出させて該本体の該貫通穴にそれぞれ固定的に収容される導電性の複数の接触子とを具備した高密度接続用コネクタにおいて、

複数の電線を相互絶縁状態に保持して前記本体の前記一端面に取付けられ、それら電線を前記複数の接触子の前記圧接部に一括して圧接する電気絶縁性の保持部材を具備し、

前記保持部材は、第1保持板と第2保持板とを相互に組合せて構成され、

前記第1保持板は、第1支持面と、該第1支持面とその裏面との間に貫通形成される開口部と、該第1支持面上で該開口部の周縁と該第1保持板の外縁との間に互いに独立して様々な方向へ延設され、少なくとも一部が該開口部の周縁から略放射状に配置される複数の第1挟持条部と、該第1挟持条部の各々に1つずつ該第1挟持条部に交差して刻設され、該第1支持面上で互いに独立して方形格子状に配列される複数の第1受容部とを備え、

前記第2保持板は、前記第1保持板の前記第1支持面对向する第2支持面と、該第2支持面上で該第1保持板の前記複数の第1挟持条部に整合すべく延設され、該第1挟持条部と協働して両挟持条部間に電線を挟持する複数の第2挟持条部と、該第2挟持条部の各々に1つずつ該第2挟持条部に交差して、該第2支持面とその裏面との間に貫通形成され、該第1保持板の前記複数の第1受容部に整合すべく方形格子状に配列される複数の第2受容部とを備え、

前記複数の接触子は、各々の前記圧接部を該接触子の軸線の周りで、前記第2保持板の対応の前記複数の第2挟持条部に直交可能な様々な角度に回転した状態で、前記本体の前記複数の貫通穴に収容され、

前記保持部材は、前記第2保持板を前記本体の前記一端面に当接して該本体に取付けられ、このとき該第2保持板の前記複数の第2受容部が、該本体に方形格子状に配置された前記複数の貫通穴にそれぞれ重畳して配置されるとともに、前記複数の接触子の前記圧接部が、該第2保持板の該複数の第2受容部にそれぞれ受容されて、前記第1挟持条部と前記第2挟持条部との間に挟持された電線に直交状態で圧接されること、を特徴とする高密度接続用コネクタ。

【請求項2】 前記第1保持板の前記第1受容部が、前記第1挟持条部の延長方向に略直交して直線状に延びる第1切込からなり、前記第2保持板の前記第2受容部が、前記第2挟持条部の延長方向に略直交して直線状に延びる第2切込からなる請求項1に記載の高密度接続用コネクタ。

【請求項3】 前記複数の接触子が、一端に形成された

前記圧接部と、他端に形成された接触部と、該圧接部と該接触部との間に形成され、前記本体の前記貫通穴の壁に当接されて該貫通穴内に該接触子自体を支持する支持部とを備え、該圧接部が該支持部に対し傾斜して配置される請求項1又は2に記載の高密度接続用コネクタ。

【請求項4】 前記複数の接触子が、前記支持部に対して前記圧接部を反対方向へ同一角度だけ折曲げて形成される2種類の接触子の群を含む請求項3に記載の高密度接続用コネクタ。

【請求項5】 請求項1に記載の高密度接続用コネクタに使用される接触子であって、

一端に形成された前記圧接部と、他端に他の導電性接触子に接触すべく形成された接触部と、該圧接部と該接触部との間に形成され、前記本体の前記貫通穴の壁に当接されて該貫通穴内に接触子自体を支持する支持部とを備え、

前記圧接部が、接触子の軸線の周りで所望角度に回転して、少なくとも一部分を前記支持部の外表面よりも外側に突出させる位置に、前記支持部に対し傾斜して配置されること、を特徴とする接触子。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、複数の電線を圧接する圧接部をそれぞれに有した複数の接触子を備えるコネクタに関し、特に、それら接触子を収容する貫通穴を絶縁性本体に方形格子状配置で備えた高密度接続用のコネクタに関する。さらに本発明は、そのようなコネクタに使用される接触子に関する。

【0002】

【従来の技術】従来、例えば交換機や伝送機器等で使用されるコネクタとして、信号線路の高密度化の要求に対応するために、複数の接触子の配置間隔（ピッチ）を縮小して高密度接続を可能にしたコネクタが種々提案されている。例えば「コンピュータデザイン」誌（電波新聞社、1991年7月号、第55頁第8図）には、IEEE規格のP1301、1標準及びEIA規格のIS-64標準に基づく2mmピッチの方形格子状配置で複数の接触子を備えた雌コネクタが開示されている。この雌コネクタは、例えば基板上に同一ピッチで配列された多数の雄形接触子に対し、所望位置に複数の雌コネクタを隣接して配置し、雄形接触子に無駄を生じることなく雌形接触子を接続できるものである。

【0003】上記の雌コネクタでは、図12に示すように、電気絶縁性本体200の対向端面間に方形格子状配置で相互に略平行に延設された複数の貫通穴202のそれぞれに、接触子204が固定的に収容されている。各接触子204は、一端にケーブルCの被覆導線Wを圧接する圧接部206を備え、他端に対応の雄形接触子に導通接触する接触部208を備える。圧接部206は、それぞれに開放スリット210を備えて接触子204の横

断方向に延設された2枚の圧接片212を備え、それらスリット210に被覆導線Wを圧入することにより、圧接片212が絶縁被覆を刺し貫いて導線に接触する。なおこのような圧入接続方式を一般に「圧接」と称する。

【0004】実開昭63-9771号公報は、ケーブルC内の複数の被覆導線Wを相互離隔状態に保持してコネクタ本体220に取付けられる導線保持部材222を備えた高密度接続用のコネクタを開示する。図13に示すように、導線保持部材222は、接触子224の圧接部226を挿入する複数の貫通切込228を有した第1カバー230と、第1カバー230の貫通切込228に対応して配設された複数の凹部232及びそれら凹部232に交差して延びる複数の保持溝234を有した第2カバー236とを、相互に組合せて構成される。このコネクタでは、複数の接触子224は圧接部226の板面をコネクタの長手方向に向けて千鳥格子状に配列され、それに対応して第1カバー230の貫通切込228及び第2カバー236の凹部232は、いずれもカバー長手方向に直線状に延びて千鳥格子状に配置される。第2カバー236の各保持溝234は、カバー横断方向に延びて各凹部232に直交する。

【0005】ケーブルCの複数の被覆導線Wは、第2カバー236に設けた開口部238に通され、相互に離隔して各保持溝234内に配置される。その状態で、第1カバー230を第2カバー236に組付けることにより、複数の被覆導線Wが複数の保持溝234に固定的に保持される。この導線保持部材222をコネクタ本体220に取付けると、各接触子224の圧接部226が第1カバー230の貫通切込228及び第2カバー236の凹部232に挿入されて、各保持溝234に保持された被覆導線Wに圧接される。

【0006】

【発明が解決しようとする課題】「コンピュータデザイン」誌に記載された上記の雌コネクタは、本体の貫通穴に収容された各接触子の、横断方向へ延長された2枚の圧接片に被覆導線を圧接できるようにするために、長尺の接触子と短尺の接触子とが異なる列に配置され、それら長さの異なる接触子の圧接部が長手方向へ互いにずれた位置で露出されている。したがってこのコネクタでは、接触子の寸法（長さ）の差に起因して、コネクタ内の信号線路間で信号の伝搬所要時間が異なり、他の通信回路部品との間での伝搬時間の整合を図ることが困難になる課題が生じる。また、複数の接触子の圧接部のスリットが、長手方向へずれた位置で同一横断方向に延びるので、全ての接触子にケーブルの複数の被覆導線を一括して同時に圧接することが困難であり、圧接作業に手間が掛かる問題を有する。さらに、接触子の圧接部は導線を圧接した状態でも露出されるので、圧接部や導線に外力が加わることにより圧接状態が変動する危惧が生じ、導通接触の信頼性に劣る課題がある。

【0007】これに対し、実開昭63-9771号公報に開示されたコネクタは、導線保持部材を使用したことにより、ケーブルの複数の被覆導線を一括して同時に圧接することができる。しかしながらこのコネクタでは、信号線路間の短絡を防止するために接触子を千鳥格子状に配置しているので、同数の接触子を方形格子状に配列した場合に比べて、コネクタの寸法が接触子配列方向に拡大されてしまう。交換機や伝送機器において、信号線路の一層の高密度化を推進するためには、信号線路を方形格子状に配置することが不可欠であるが、このコネクタはそのような高密度の接続に対応することができない。

【0008】したがって本発明の目的は、複数の接触子を方形格子状に配置した高密度接続用のコネクタにおいて、同一寸法（特に同一長さ）の接触子を使用でき、全ての接触子にケーブルの複数の被覆導線を一括して同時に圧接でき、しかも圧接部や導線への外力の影響を回避できる接続信頼性に優れたコネクタを提供することにある。本発明の他の目的は、そのようなコネクタに使用される接触子を提供することにある。

【0009】

【課題を解決するための手段】上記目的を達成するために、本発明は、一対の対向端面間に延びる複数の貫通穴を相互に略平行に方形格子状配置で備えた電気絶縁性の本体と、電線を圧接する圧接部を各々の一端に備え、圧接部を本体の一端面から突出させて本体の貫通穴にそれぞれ固定的に収容される導電性の複数の接触子とを具備した高密度接続用コネクタにおいて、複数の電線を相互絶縁状態に保持して本体の一端面に取付けられ、それら電線を複数の接触子の圧接部に一括して圧接する電気絶縁性の保持部材を具備した高密度接続用コネクタを提供する。この保持部材は、第1保持板と第2保持板とを相互に組合せて構成される。第1保持板は、第1支持面と、第1支持面とその裏面との間に貫通形成される開口部と、第1支持面上で開口部の周縁と第1保持板の外縁との間に互いに独立して様々な方向へ延設され、少なくとも一部が開口部の周縁から略放射状に配置される複数の第1挟持条部と、第1挟持条部の各々に1つずつ第1挟持条部に交差して刻設され、第1支持面上で互いに独立して方形格子状に配列される複数の第1受容部とを備える。第2保持板は、第1保持板の第1支持面に対向する第2支持面と、第2支持面上で第1保持板の複数の第1挟持条部に整合すべく延設され、第1挟持条部と協働して両挟持条部間に電線を挟持する複数の第2挟持条部と、第2挟持条部の各々に1つずつ第2挟持条部に交差して、第2支持面とその裏面との間に貫通形成され、第1保持板の複数の第1受容部に整合すべく方形格子状に配列される複数の第2受容部とを備える。複数の接触子は、各々の圧接部を接触子の軸線の周りで、第2保持板の対応の複数の第2挟持条部に直交可能な様々な角度に

回転した状態で、本体の複数の貫通穴に収容される。そして保持部材は、第2保持板を本体の一端面に当接して本体に取付けられ、このとき第2保持板の複数の第2受容部が、本体に方形格子状に配置された複数の貫通穴にそれぞれ重畳して配置されるとともに、複数の接触子の圧接部が、第2保持板の複数の第2受容部にそれぞれ受容されて、第1挟持条部と第2挟持条部との間に挟持された電線に直交状態で圧接されるようになっている。

【0010】さらに本発明は、上記高密度接続用コネクタにおいて、第1保持板の第1受容部が、第1挟持条部の延長方向に略直交して直線状に延びる第1切込からなり、第2保持板の第2受容部が、第2挟持条部の延長方向に略直交して直線状に延びる第2切込からなる高密度接続用コネクタを提供する。さらに本発明は、上記高密度接続用コネクタにおいて、複数の接触子が、一端に形成された圧接部と、他端に形成された接触部と、圧接部と接触部との間に形成され、本体の貫通穴の壁に当接されて貫通穴内に接触子自体を支持する支持部とを備え、圧接部が支持部に対し傾斜して配置される高密度接続用コネクタを提供する。

【0011】さらに本発明は、上記高密度接続用コネクタにおいて、複数の接触子が、支持部に対して圧接部を反対方向へ同一角度だけ折曲げて形成される2種類の接触子の群を含む高密度接続用コネクタを提供する。

【0012】さらに本発明によれば、上記高密度接続用コネクタに使用される接触子であって、一端に形成された圧接部と、他端に他の導電性接触子に接触すべく形成された接触部と、圧接部と接触部との間に形成され、本体の貫通穴の壁に当接されて貫通穴内に接触子自体を支持する支持部とを備え、圧接部が、接触子の軸線の周りで所望角度に回転して、少なくとも一部分を支持部の外表面よりも外側に突出させる位置に、支持部に対し傾斜して配置されること、を特徴とする接触子が提供される。

【0013】

【発明の実施の形態】以下、添付図面を参照して、本発明をその実施形態に基づき詳細に説明する。図面を参照すると、図1は本発明の一実施形態によるコネクタ10の主要部を分解斜視図で示す。コネクタ10は、本体12と、本体12の所定位置に絶縁支持される複数の接触子14と、接触子14に接続されるケーブルCの複数の被覆導線Wを分離保持して本体12に取付けられる導線保持部材16とを備える。

【0014】本体12は、プラスチック等の電気絶縁体からなる略直方体形状のハウジングであり、略矩形平面形状の対向する前端面18と後端面20との間に、相互に略平行に延びる複数の貫通穴22を4行6列の方形格子状配置で備える。複数の貫通穴22は、いずれも同一の矩形断面形状を有し、各貫通穴22の壁面が本体12の外周面に平行となるように、かつ隣合う貫通穴22の

対応壁面が相互に平行となるように配置される。本体12の前端面18において、各貫通穴22の開口部にはテーパー状の周面24が形成され、周面24の内奥に接触子14の接触部（後述する）が配置される。このような構成を有する本体12は、交換機や伝送機器等で高密度の接続に対応可能なコネクタに適用でき、例えばIEEE規格のP1301、1標準及びEIA規格のIS-64標準に基づく2mmピッチの方形格子状配置で複数の接触子を備える雌コネクタに適用できる。

【0015】接触子14は、図2に示すように、平坦な導電性金属板から打抜いて形成される。打抜き形状の接触子14は、略中央の矩形基部26と、矩形基部26の一長辺の両端近傍から相互に平行に延長される一対の脚部28と、矩形基部26の他長辺の中央から脚部28の反対方向に延長される腕部30と、腕部30の先端に側方延長部分を有して連結される矩形支持部32と、矩形支持部32から腕部30の反対側に延設される連結部34と、矩形支持部32から僅かに離間して連結部34に連結される圧接部36とを備える。一対の脚部28の先端には接触部38が形成され、矩形支持部32の側方延長部分の反対側には爪40が突設される。圧接部36は、接触子14の長手方向に延設される一対の刃42を備え、それら刃42の間に腕部30の延長方向に平行に延びる開放スリット44が画成される。

【0016】コネクタ10では、図2に示す打抜き形状の接触子14を、異なる方向に折曲げて形成できる2種類の接触子14a及び14bが使用される。図3(a)に示すように、接触子14aは、接触子14の基部26を図2に示す折線46、48に関して谷折式に略直角に折曲げるとともに支持部32を折線50に関して谷折式に略直角に折曲げ、さらに圧接部36を折線52に関して谷折式に、かつ支持部32の折曲げられなかった部分の表面に対し好ましくは $115^{\circ} \sim 120^{\circ}$ の角度 α に折曲げて形成される。また図3(b)に示すように、接触子14bは、接触子14の基部26を図2に示す折線46、48に関して山折式に略直角に折曲げるとともに支持部32を折線50に関して山折式に略直角に折曲げ、さらに圧接部36を折線52に関して山折式に、かつ支持部32の折曲げられなかった部分の表面に対し好ましくは $115^{\circ} \sim 120^{\circ}$ の角度 α に折曲げて形成される。

【0017】このようにして曲成された接触子14a、14bはいずれも、圧接部36が矩形支持部32の側方延長部分に対し傾斜して側方延長部分の外側に少なくとも部分的に突出した形状となっている。さらに、接触子14a、14bの一対の脚部28は先端へ向かって徐々に相互接近するように、かつ一対の接触部38は先端へ向かって徐々に相互離反するように曲成される。それにより、他の雄形接触子に導通接触可能な雌形の接触部38が構成される。

【0018】図4及び図5に示すように、複数の接触子14a、14bは、コネクタ10の本体12の複数の貫通穴22を、それらに設置する接触子14a、14bの種類及び設置方向に応じて2行3列ずつの4つの群に等分して、以下のように各群の貫通穴22に設置される。すなわち、本体12の後端面20にて図で左上に示される群の6個の貫通穴22には、それぞれ接触子14aを、それらの矩形支持部32及び圧接部36が本体12の上面54側に配置されるようにして挿入する。また、本体12の後端面20にて図で右下に示される群の6個の貫通穴22には、それぞれ接触子14aを、それらの矩形支持部32及び圧接部36が本体12の下面56側に配置されるようにして挿入する。

【0019】さらに、本体12の後端面20にて図で右上に示される群の6個の貫通穴22には、それぞれ接触子14bを、それらの矩形支持部32及び圧接部36が本体12の上面54側に配置されるようにして挿入する。また、本体12の後端面20にて図で左下に示される群の6個の貫通穴22には、それぞれ接触子14bを、それらの矩形支持部32及び圧接部36が本体12の下面56側に配置されるようにして挿入する。

【0020】このようにして全ての接触子14a、14bは、貫通穴22内でそれらの一対の接触部38を本体12の上面54側及び下面56側に向けて配置される一方で、それらの圧接部36を本体12の後端面20から外方へ突出させ、かつ等分された4つの貫通穴群の間では圧接部36を互いに異なる位置で傾斜させて配置される。各貫通穴22に挿入された各接触子14a、14bは、その矩形基部26、腕部30及び矩形支持部32が貫通穴22の壁に当接され、さらに爪40が貫通穴22の壁に係合することにより、貫通穴22内の所定位置に固定的に支持される。

【0021】また、接触子14a、14bが貫通穴22内の所定位置に配置されると、傾斜した圧接部36の底面58は、本体12の後端面20近傍で貫通穴22の壁に設けられた肩部60に当接される。その結果、接触子の圧接部36にケーブル導線を圧接する際の押圧力が本体12の肩部60によって受止められ、押圧力による接触子の連結部34の変形や破損が防止される。

【0022】図6～図8に示すように、導線保持部材16は、いずれもプラスチック等の電気絶縁体からなる第1保持板62と第2保持板64とを相互に組合せて構成される。第1保持板62は、本体12の後端面20に対応する略矩形平面形状の第1支持面66を備える。第1支持面66とその反対側の裏面68との間には、矩形の対向短辺を構成する第1保持板62の一方の外縁から他方の外縁近傍まで、第1支持面66の略中心を通過して第1保持板62の長手方向に延びる開口部70が貫通形成される。

【0023】第1支持面66には、開口部70の周縁7

2と第1保持板62の外縁74との間に延長される複数の(24個)の第1挟持条部76が、互いに交差しないように独立して形成される。それら第1挟持条部76は、開口部70の周縁72から異なる方向へ傾斜して延びる4つの群に等分される。4群に分配された複数の第1挟持条部76は、開口部70に関して対称に延び、各群内では、6個の第1挟持条部76が互いに平行に延びる。また、開口部70に対し同一側に配置される2つの群は、開口部70の周縁72から第1保持板62の外縁74に向かって、相互間隔を徐々に広げるように互いに線対称に延びる第1挟持条部76を備える。このようにして全ての第1挟持条部76は、第1支持面66上で開口部70を中心に略放射状に配置される。

【0024】各第1挟持条部76は、隣接する第1挟持条部76の間に壁78を画成する溝の形状を有し、各溝内に、比較的底の浅い部分80と、比較的底の深い部分82と、両部分80、82を互いに連結する斜面部分84とが設けられる。隣接する第1挟持条部76の間では、比較的底の浅い部分80と比較的底の深い部分82とが交互位置に配置される。なお、各群の外端及び内端に配置される第1挟持条部76(特に符号76'で示す)には、比較的底の浅い部分80のみが設けられる。また、内端の第1挟持条部76に対しては、被覆導線Wの配置を容易にするために、開口部70が第1支持面66の横断方向に延長されている。

【0025】そして、第1挟持条部76の各々に1つずつ、第1挟持条部76の延長方向に略直交して直線状に延びる第1切込86が、比較的底の浅い部分80に所望深さに刻設される。これら第1切込86は、互いに交差することなく独立して、第1支持面66上で方形格子状に配列される。後述するように、複数の第1切込86は、本体12に収容された複数の接触子14の圧接部36をそれぞれに受容するものであり、したがってその方形格子状配置は、本体12における複数の接触子14の方形格子状配置に対応する。また複数の第1切込86は、第1保持板62の外縁74に対し、圧接部36の傾斜に対応した角度で傾斜して延びる。すなわち、接触子14の腕部30と圧接部36との成す角度 α は、第1保持板62の短辺側の外縁74(特に符号74'で示す)と第1切込86との成す鈍角に対応する。

【0026】第2保持板64は、本体12の後端面20に対応する略矩形平面形状の第2支持面88を備える。第2支持面88は、第1保持板62と第2保持板64とを組合せたときに、第1保持板62の第1支持面66に対向して相互係合するものであり、第1保持板62の開口部70に重畳する平坦面部分90を中央に有する。

【0027】第2支持面88には、第1保持板62の複数の第1挟持条部76に対応して、平坦面部分90の周縁92と第2保持板64の外縁94との間に延長される複数の(24個)の第2挟持条部96が、互いに交差しな

いように独立して形成される。それら第2挟持条部96は、第1挟持条部76と同様に、平坦面部分90の周縁92から異なる方向へ傾斜して延びる4つの群に等分される。4群に分配された複数の第2挟持条部96は、平坦面部分90に関して対称に延び、各群内では、6個の第2挟持条部96が互いに平行に延びる。また、平坦面部分90に対し同一側に配置される2つの群は、平坦面部分90の周縁92から第2保持板64の外縁94に向かって、相互間隔を徐々に広げるように互いに線対称に延びる第2挟持条部96を備える。このようにして全ての第2挟持条部96は、第2支持面88上で平坦面部分90を中心に略放射状に配置される。

【0028】各第2挟持条部96には、各第1挟持条部76の比較的底の深い部分82に嵌入される突起部分98と、比較的底の浅い部分80に対向する溝部分100と、両部分98、100を互いに連結する斜面部分102とが設けられる。隣接する第2挟持条部96の間では、突起部分98と溝部分100とが交互位置に配置される。なお、各群の外端及び内端に配置される第2挟持条部96（特に符号96'で示す）には、溝部分100のみが設けられる。

【0029】第2保持板64と第1保持板62とを組合せたときに、第2挟持条部96と第1挟持条部76との間には隙間Gが形成され、この隙間GにケーブルCの被覆導線Wが挟持される。このとき、両挟持条部76、96が段差を有して延びるので、被覆導線Wが摩擦により隙間Gに固定的に保持される。また、第2挟持条部96の突起部分98が第1挟持条部76の比較的底の深い部分82に嵌入されることにより、両保持板62、64が横方向への移動に関し互いに拘束される。さらに、突起部分98が比較的底の深い部分82に密に嵌入されるように設計することにより、両保持板62、64を互いに固定することもできる。

【0030】第2挟持条部96の各々に1つずつ、第2挟持条部96の延長方向に略直交して直線状に延びる第2切込104が、第2支持面88とその反対側の裏面106との間を貫通して溝部分100に刻設される。これら第2切込104は、第1保持板62の複数の第1切込86に整合すべく、互いに交差することなく独立して、第2支持面88上で方形格子状に配列される。後述するように、複数の第2切込104は複数の第1切込86と協働して、本体12に収容された複数の接触子14の圧接部36をそれぞれに受容するものであり、したがってその方形格子状配置は、本体12における複数の接触子14の方形格子状配置に対応する。また複数の第2切込104は、第2保持板64の外縁94に対し、圧接部36の傾斜に対応した角度で傾斜して延びる。すなわち、接触子14の腕部30と圧接部36との成す角度 α は、第2保持板64の短辺側の外縁94（特に符号94'で示す）と第2切込104との成す鈍角に対応する。

【0031】導線保持部材16にケーブルCの被覆導線Wを保持させる際には、まず図6に示すように、第1保持板62の裏面68側から開口部70に複数の被覆導線Wを挿入し、それら被覆導線Wを互いに分離してそれぞれ第1挟持条部76に沿って配置する。このとき各導線Wの先端は、好ましくは第1保持板62の外縁74から突出する。その状態で、第2保持板64を第1保持板62に組合せ、第1挟持条部76と第2挟持条部96とを係合させて、両挟持条部76、96の間に被覆導線Wを挟持させる。このようにして複数の被覆導線Wは、導線保持部材16内で相互絶縁状態に保持される。なお、第1保持板62の外縁74から突出した被覆導線Wの余剰部分は、好ましくはこの状態で切除される。

【0032】被覆導線Wを保持した導線保持部材16は、図1に示すように第2保持板64の裏面106を本体12の後端面20に対向させ、本体12に支持された複数の接触子14の圧接部36を第2保持板64の複数の第2切込104に挿入しつつ、本体12の後端面20に取付けられる。このとき、複数の接触子14の圧接部36を所定圧力下で第2保持板64の複数の第2切込104に挿入することにより、各圧接部36の両刃42が第1挟持条部76と第2挟持条部96との間に挟持された被覆導線Wの絶縁被覆を刺し貫いてスリット44に導線が直交状態で嵌入され、導電接触状態が得られる。この状態で、各圧接部36の両刃42の先端部分は、第1保持板62の第1切込86に受容される。このようにして複数の接触子14に複数の被覆導線Wが圧接されると、導線保持部材16は本体12に固定的に取着される。

【0033】コネクタ10はさらに、図9及び図10に示すように、本体12に取付けられた導線保持部材16とケーブルCの端末で露出される被覆導線Wとを被覆保護する外郭部材108を備えることができる。外郭部材108は、ケーブルCを挿通する中心開口110を備えるとともに、本体12の上面54及び下面56の各突子112に係合する上壁114及び下壁116を備え、中心開口110にケーブルCを挿通した状態で本体12に固定的に装着される。このとき、外郭部材108の内面に設けられた肩部118が、導線保持部材16の第1保持板62の裏面68に当接され、それにより導線保持部材16が本体12にさらに強固に固定される。

【0034】このようにコネクタ10では、導線保持部材16を使用したことにより、本体12に方形格子状に高密度配置された同一寸法の複数の接触子14に、ケーブルCの複数の被覆導線Wを一括して同時に圧接することができる。また、接触子14の圧接部36と被覆導線Wとの接触箇所は、圧接と同時に導線保持部材16の内部に遮蔽され、しかも被覆導線Wは第1保持板62と第2保持板64との間に固定的に保持されるので、外力の影響により圧接状態が変動する危険が回避され、コネクタ10の接続信頼性が向上する。

【0035】なお、接触子14の圧接部36と、導線保持部材16の第1及び第2挟持条部76、96並びに第1及び第2切込86、104とを、接触子14の整列方向に対して上記したように傾斜させる構成は、方形格子状に高密度配置された複数の接触子14に、被覆導線Wを相互絶縁状態で無理なく一括して圧接できるようにするために不可欠のものである。前述した傾斜角度 α の好適な範囲 $115^{\circ} \sim 120^{\circ}$ は、接触子14に圧接可能な被覆導線Wの径寸法を最も拡大できる範囲である。また、第1及び第2挟持条部76、96と第1及び第2切込86、104とが互いに直交して延びるので、接触子14の圧接部36の刃42の表面と被覆導線Wとは直交状態で圧接される。その結果、導線をスリット44に嵌入する際に導線に加わる不都合な曲げ応力や剪断応力が低減され、一層優れた接続信頼性が得られる。

【0036】本発明に係るコネクタは、上記実施形態に限定されるものではなく、例えば圧接部の傾斜方向が異なる複数種類の接触子を上記以外の組合せで使うことができる。ただし、例えばコネクタ10において、全ての接触子14の圧接部36の傾斜方向を同一とした場合は、導線保持部材16の第1及び第2挟持条部76、96も全て同一方向に傾斜させることになり、この場合、全ての被覆導線Wを確実に挟持するために導線保持部材16を長手方向に延長して、両挟持条部76、96の形成空間を確保しなければならない。その結果、接触子14を配置できない無駄な空間がコネクタ10に生じ、接触子のピッチを均等に維持しつつ本体12の側面方向に同様の構成を有するコネクタを連続して隣接配置できることが要求される高密度接続用のコネクタには適用できなくなる。したがってそのような不都合を排除できる条件で、複数種類の接触子の組合せを設定することが肝要である。

【0037】図11は、高密度接続用のコネクタに適用可能な複数種類の接触子の様々な組合せ、及びそれに対応する導線保持部材の様々な構成の例を概略で示す。図11(a)は、3行3列の方形格子状に配置された9個の貫通穴22'に、それぞれ前述の接触子14a、14bを設置した本体12'を、その後端面20'から示す。この場合、9個の貫通穴22'は、それらに設置する接触子14a、14bの種類及び設置方向に応じて、4つの群に分割される。図において、左上の2個の貫通穴22'には、それぞれ接触子14aがそれらの圧接部36を本体12'の上面54'側に向けて設置される。また、右下の2個の貫通穴22'には、それぞれ接触子14aがそれらの圧接部36を本体12'の下面56'側に向けて設置される。さらに、右上の1個の貫通穴22'には、接触子14bがその圧接部36を本体12'の上面54'側に向けて設置される。また、左下の4個の貫通穴22'には、それぞれ接触子14bがそれらの圧接部36を本体12'の下面56'側に向けて設置さ

れる。

【0038】図11(b)は、このような接触子配置を有した本体12'に組付けられる導線保持部材の第1保持板62'を、その第1支持面66'から示す。第1保持板62'の第1支持面66'と裏面との間には、対向する一方の外縁から他方の外縁近傍まで延びる開口部70'が貫通形成される。第1支持面66'には、本体12'の複数の接触子14の圧接部36に対応して、各々傾斜して方形格子状に配置される複数の第1切込86'が設けられる。さらに、各第1切込86'に直交して、開口部70'の周縁72'と第1保持板62'の外縁74'との間に延長される複数の第1挟持条部76'が、互いに交差しないように独立して形成される。それら第1挟持条部76'は、第1支持面66'上で開口部70'を中心に略放射状に配置される。このような構成によっても、前述の実施形態と同様の効果が得られることは言うまでもない。

【0039】図11(c)に示す例は、図11(a)と同様の3行3列の方形格子状に配置された9個の貫通穴22''を有する本体12''に対し、前述の接触子14a、14bと、さらに異なる形状の接触子14cとを設置したものである。この場合、9個の貫通穴22''は、それらに設置する接触子14a、14b、14cの種類及び設置方向に応じて、3つの群に分割される。なお、接触子14cは、接触子14a、14bの圧接部36が傾斜しないものであって、同様に図2の打抜き形状の接触子14から形成できる。図において、上方の3個の貫通穴22''には、それぞれ接触子14cがそれらの圧接部36を本体12''の上面54''側に向けて設置される。また、右下の2個の貫通穴22''には、それぞれ接触子14aがそれらの圧接部36を本体12''の下面56''側に向けて設置される。さらに、左下の4個の貫通穴22''には、それぞれ接触子14bがそれらの圧接部36を本体12''の下面56''側に向けて設置される。

【0040】図11(d)は、このような接触子配置を有した本体12''に組付けられる導線保持部材の第1保持板62''を、その第1支持面66''から示す。第1保持板62''には、図11(b)の第1保持板62'と同様の開口部70''が貫通形成される。第1支持面66''には、本体12''の複数の接触子14の圧接部36に対応して、各々傾斜して又は傾斜せずに方形格子状に配置される複数の第1切込86''が設けられる。さらに、各第1切込86''に直交して、開口部70''の周縁72''と第1保持板62''の外縁74''との間に延長される複数の第1挟持条部76''が、互いに交差しないように独立して形成される。

【0041】それら第1挟持条部76''のうち、第1支持面66''の開口部70''の下方部分に配置される第1挟持条部76''は、第1支持面66''上で開口部70''を中心に略放射状に配置される。また、第1支持面6

6”の開口部70”の上方部分に配置される第1挟持条部76”は、第1支持面66”上で開口部70”の周縁72”に略直交して配置される。このように、本体の複数の貫通穴をそれらに設置する接触子の種類及び設置方向に応じて複数の群に分割したときに、1つの群を1列のみに整列する群から構成できる場合は、その群の接触子は圧接部を傾斜させずとも、ケーブルの被覆導線を圧接部に直交状態で良好に圧接できるのである。

【0042】このように本発明は、複数の接触子を3行3列以上の方形格子状に配置したコネクタに適用でき、それら接触子をその圧接部の傾斜形態に応じて少なくとも3群に分割して、複数の被覆導線を各群の接触子の圧接部に直交状態で圧接できるように、接触子群に対応する導線保持部材の少なくとも1群の挟持条部を開口部周縁から外縁へ略放射状に配置することにより、複数の導線の一括接続を可能にするものである。そのような観点では、導線保持部材の各切込は、図示実施形態の形状に限らず、接触子の圧接部を受容可能なあらゆる形状を採用することができる。しかも本発明に係るコネクタは、圧接部の傾斜角度が全て異なる接触子と、それに対応して挟持条部の傾斜角度が全て異なる導線保持部材とを使用することもできる。また本発明は、圧接部を接触子の軸線の周りで所望の角度に回転ないし傾斜させた接触子であれば、前述の実施形態に示す2枚の接触部28を有した接触子14に限らず、1枚の接触部を有した雌形接触子や、ピン状接触部を有した雄形接触子を使用することができ、したがって、そのような接触子の形状に対応した本体を有する雌コネクタ又は雄コネクタに適用できる。

【0043】

【発明の効果】以上の説明から明らかなように、本発明は、複数の接触子を方形格子状に配置した高密度接続用のコネクタにおいて、特に長さ方向へ同一寸法の接触子を使用し、またコネクタ本体に収容された全ての接触子にケーブルの複数の被覆導線を一括して同時に圧接し、しかも接触子の圧接部や、圧接部に圧接された導線への外力の影響を可及的に回避することを可能にする。さらに本発明は、そのような高密度接続用コネクタに使用される接触子を提供する。したがって本発明によれば、コネクタ内部での接触子と電線との接続信頼性を向上させた高性能の高密度接続用コネクタが提供される。

【図面の簡単な説明】

【図1】本発明の一実施形態による高密度接続用コネクタの主要部を分解して示す斜視図である。

【図2】図1のコネクタに使用される接触子を打抜き形状で示す展開平面図である。

【図3】図2の打抜き形状の接触子から折曲げ形成された図1のコネクタに使用される2種類の接触子の斜視図であって、(a)に示す接触子と(b)に示す接触子と

は、対応部分を互いに反対方向に折曲げて形成される。

【図4】図3の接触子を収容した図1のコネクタの本体を後方から示す斜視図である。

【図5】図4のコネクタ本体の断面図である。

【図6】図1のコネクタに使用される保持部材の第1保持板をケーブル導線とともに示す斜視図である。

【図7】図1のコネクタに使用される保持部材の第2保持板の斜視図である。

【図8】図1のコネクタに使用される保持部材を、図6の線VIII-VIIIに沿って示す断面図である。

【図9】図1のコネクタの組立時の断面図である。

【図10】図1のコネクタの組立時の斜視図である。

【図11】本発明の他の実施形態によるコネクタの接触子の圧接部と保持部材の挟持条部及び切込とを概略で示す図で、(a)接触子を収容した本体を後方から示す平面図、(b)aの本体に組付けられる保持部材の第1保持板の第1支持面を示す平面図、(c)aとは異なる組合せの接触子を収容した本体を後方から示す平面図、及び(d)cの本体に組付けられる保持部材の第1保持板の第1支持面を示す平面図、である。

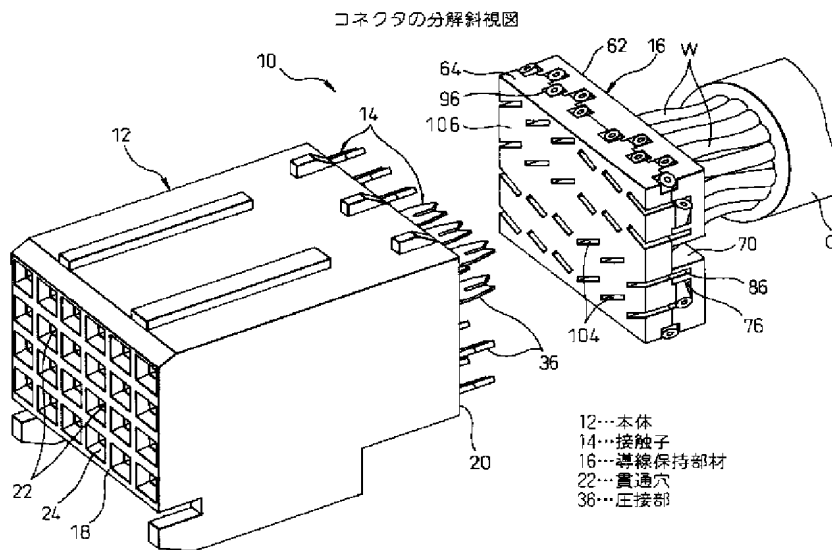
【図12】従来の高密度接続用コネクタの図で、(a)ケーブル導線を接触子に接続した本体の斜視図、(b)aの本体に外郭部材を取付けた状態の断面図、及び(c)使用される接触子の斜視図、である。

【図13】他の従来の高密度接続用コネクタの図で、(a)接触子を支持した本体とケーブル導線を保持した保持部材とを分解して示す斜視図、(b)aの保持部材の第1カバーの斜視図、及び(c)aの保持部材の第2カバーをケーブル導線とともに示す斜視図、である。

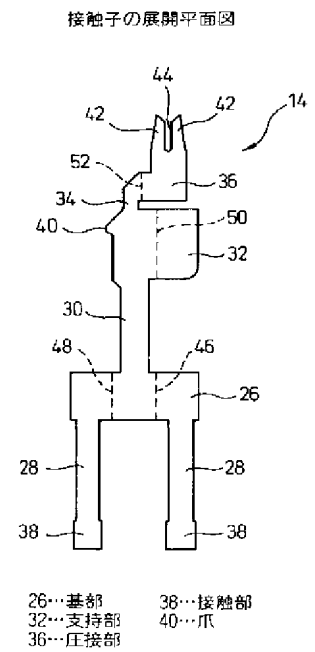
【符号の説明】

- 12…本体
- 14、14a、14b…接触子
- 16…導線保持部材
- 20…後端面
- 22…貫通穴
- 26…基部
- 32…支持部
- 36…圧接部
- 38…接触部
- 40…爪
- 62…第1保持板
- 64…第2保持板
- 66…第1支持面
- 70…開口部
- 76…第1挟持条部
- 86…第1切込
- 88…第2支持面
- 96…第2挟持条部
- 104…第2切込

【図1】

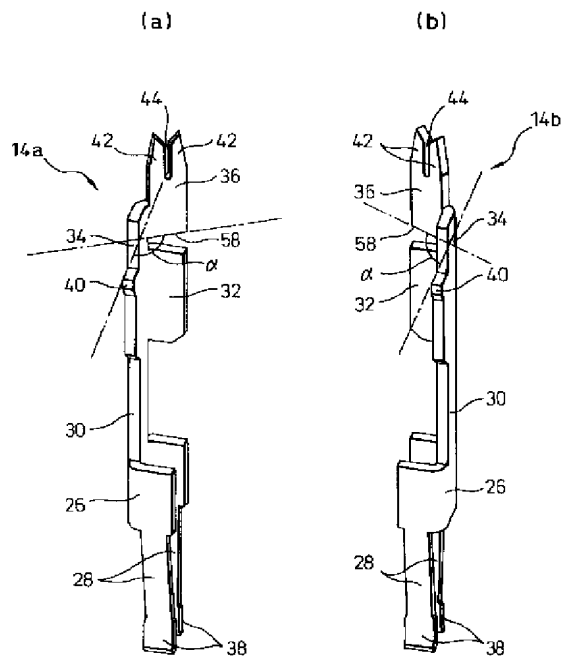


【図2】



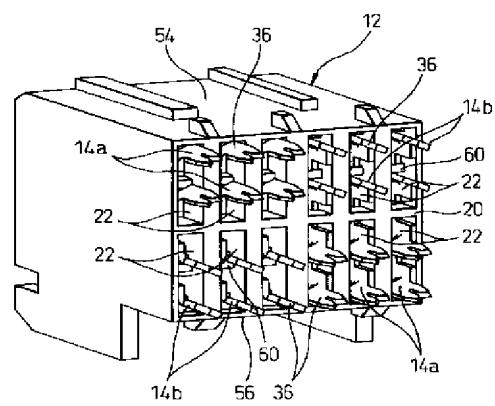
【図3】

接触子の斜視図



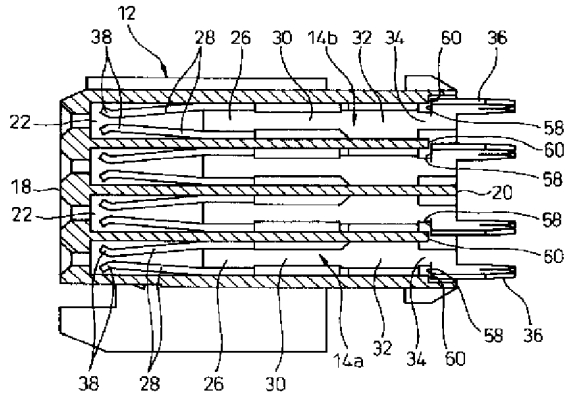
【図4】

コネクタ本体の後方斜視図



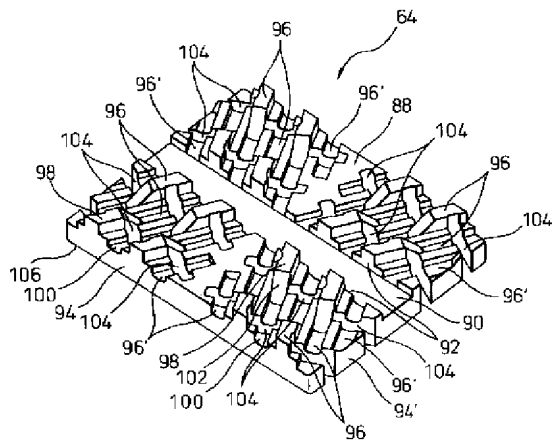
【図5】

コネクタ本体の断面図



【図7】

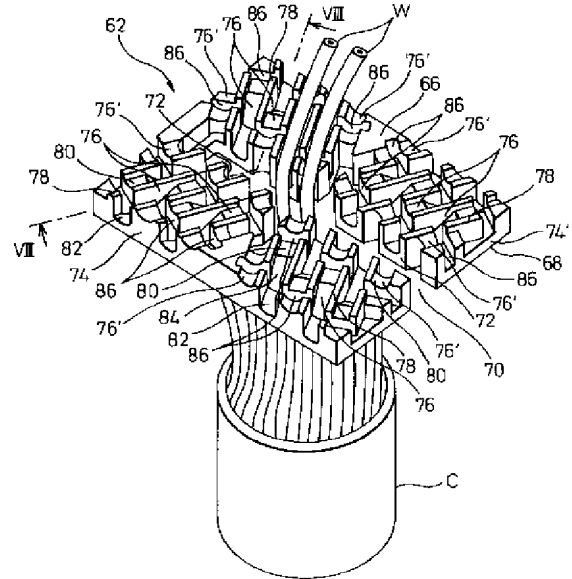
第2保持板の斜視図



64…第2保持板
88…第2支持面
96…第2挟持条部
104…第2切込

【図6】

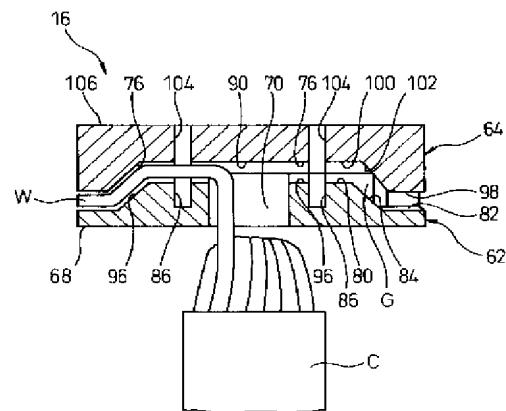
第1保持板の斜視図



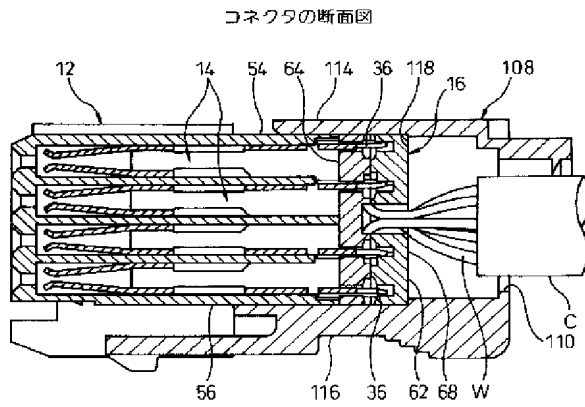
62…第1保持板
66…第1支持面
70…開口部
76…第1挟持条部
86…第1切込

【図8】

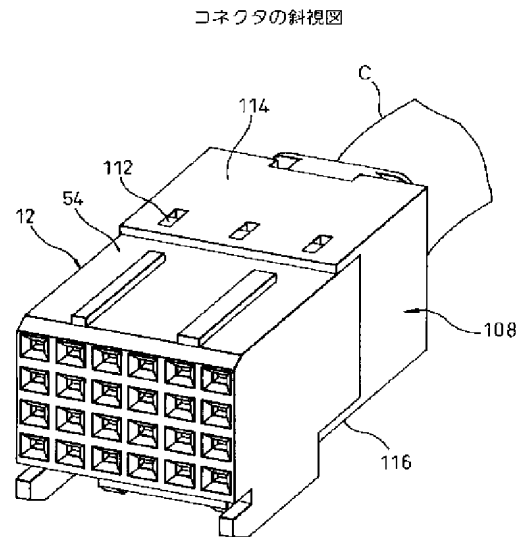
導線保持部材の断面図



【図9】

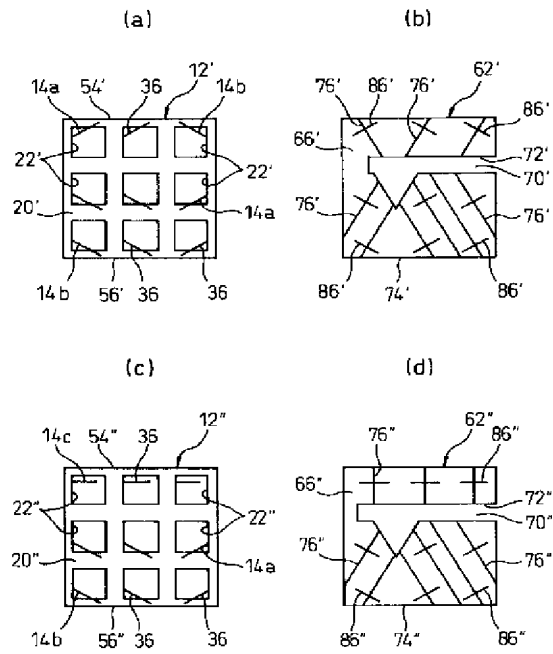


【図10】

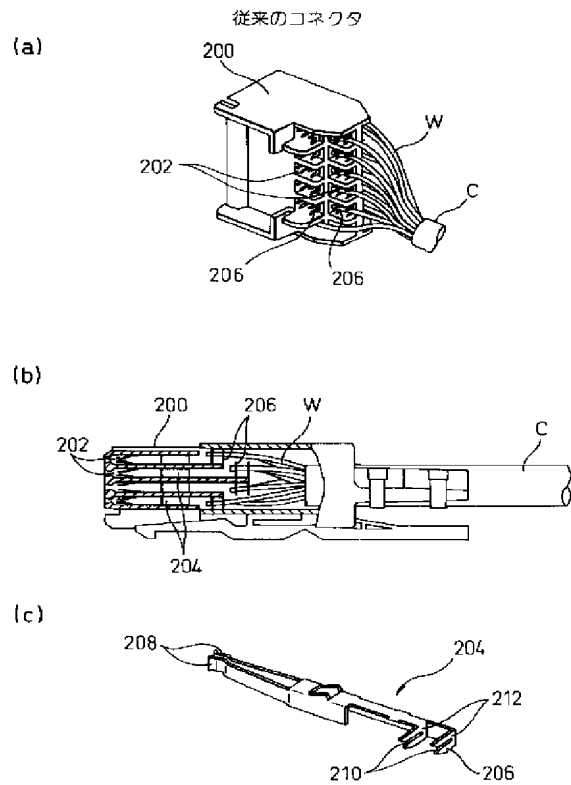


【図11】

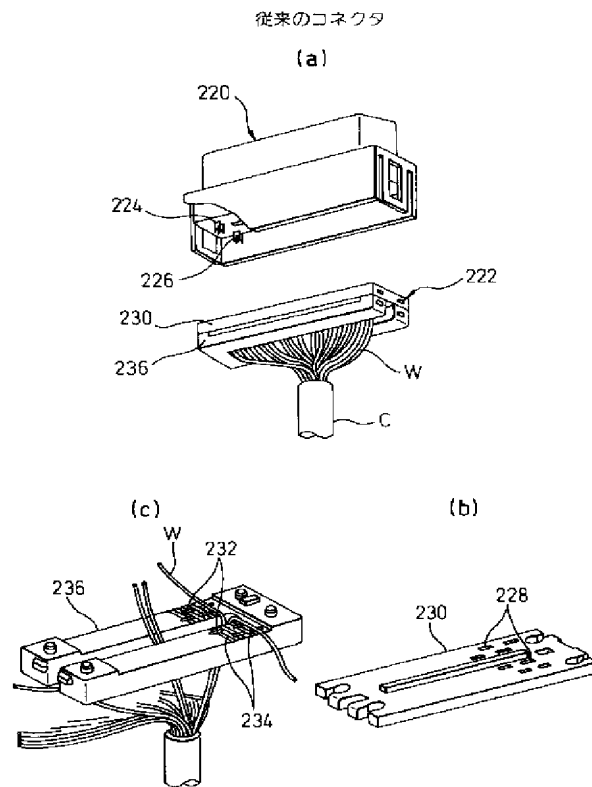
他の実施形態によるコネクタ



【図12】



【図13】



フロントページの続き

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The body of the electric insulation which equipped abbreviation parallel with two or more through holes prolonged in the opposite edge face-to-face of a pair by rectangular grid-like arrangement mutually, In the connector for high density connection possessing two or more conductive contact which equip each end with the pressure-welding section which carries out the pressure welding of the electric wire, and this pressure-welding section is made to project from the end side of this body, and is held in this through hole of this body fixed, respectively Hold two or more electric wires in the mutual insulation condition, and it is attached in said end side of said body. The attachment component of the electric insulation which carries out the pressure welding of these electric wires to said pressure-welding section of two or more of said contact collectively is provided. Said attachment component It is mutually constituted combining the 1st maintenance plate and the 2nd maintenance plate. Said 1st maintenance plate Opening by which penetration formation is carried out between the 1st back face, and this 1st back face and its rear face, Two or more 1st pinching **** by which mutually-independent is carried out between the periphery of this opening, and the rim of this 1st maintenance plate on this 1st back face, it is installed in the various directions, and at least a part is arranged from the periphery of this opening at an abbreviation radial, This 1st pinching **** is intersected, and it is engraved on every one each of this 1st pinching ****, and has two or more 1st acceptance sections which carry out mutually-independent on this 1st back face, and are arranged in the shape of a rectangular grid. Said 2nd maintenance plate The 2nd back face which counters said 1st back face of said 1st maintenance plate, and two or more 2nd pinching **** which are installed that it should have consistency on this 2nd back face in said two or more 1st pinching **** of this 1st maintenance plate, collaborate with this 1st pinching ****, and pinch an electric wire between both pinching ****, Intersect every one each of this 2nd pinching **** at this 2nd pinching ****, and penetration formation is carried out between this 2nd back face and its rear face. It has two or more 2nd acceptance sections arranged in the shape of a rectangular grid that it should have consistency in said two or more 1st acceptance sections of this 1st maintenance plate. Said two or more contact Where each the section of said pressure welding is rotated at various include angles which can intersect perpendicularly with said two or more 2nd pinching **** of correspondence of said 2nd maintenance plate around the axis of this contact It holds in said two or more through holes of said body. Said attachment component While said 2nd maintenance plate is

attached by this body in contact with said end side of said body, and said two or more 2nd acceptance sections of this 2nd maintenance plate are overlapped on said two or more through holes arranged in the shape of a rectangular grid at this body, respectively and are arranged at this time The connector for high density connection characterized by for said pressure-welding section of two or more of said contact being received by these two or more 2nd acceptance sections of this 2nd maintenance plate, respectively, and carrying out a pressure welding to the electric wire pinched between said 1st pinching **** and said 2nd pinching **** in the state of a rectangular cross.

[Claim 2] The connector for high density connection according to claim 1 which consists of the 1st cut to which said 1st acceptance section of said 1st maintenance plate carries out an abbreviation rectangular cross in the extended direction of said 1st pinching ****, and extends in the shape of a straight line, and consists of the 2nd cut to which said 2nd acceptance section of said 2nd maintenance plate carries out an abbreviation rectangular cross in the extended direction of said 2nd pinching ****, and extends in the shape of a straight line.

[Claim 3] The connector [equipped with the supporter with which said two or more contact is formed between said pressure-welding section formed in the end, the contact section formed in the other end, and this pressure-welding section and this contact section, is contacted by the wall of said through hole of said body, and supports this contact itself in this through hole] for high density connection according to claim 1 or 2 by which this pressure-welding section is arranged by inclining to this supporter.

[Claim 4] The connector for high density connection according to claim 3 in which said two or more contact contains the group of two kinds of contact which only the same include angle bends said pressure-welding section to an opposite direction, and is formed to said supporter.

[Claim 5] Said pressure-welding section which is contact used for the connector for high density connection according to claim 1, and was formed in the end, It is formed between the contact section formed in the other end that other conductive contact should be contacted, and this pressure-welding section and this contact section. Have the supporter which is contacted by the wall of said through hole of said body, and supports contact itself in this through hole, and said pressure-welding section rotates at a request include angle around the axis of contact. Contact characterized by being inclined and arranged to said supporter in the location which makes at least a part project outside the outside surface of said supporter.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the connector for high density connection which equipped the insulating body with the through hole which holds these contact especially by rectangular grid-like arrangement about a connector equipped with two or more contact which had in each the pressure-welding section which carries out the pressure welding of two or more electric wires. Furthermore, this invention relates to

contact used for such a connector.

[0002]

[Description of the Prior Art] As a connector used by the former, for example, the exchange, a transmission device, etc., since it corresponds to the demand of the densification of a signal-line way, the connector which reduced arrangement spacing (pitch) of two or more contact, and enabled high density connection is proposed variously. For example, the female connector equipped with two or more contact by the rectangular grid-like arrangement of 2mm pitch based on P1301.1 criterion of IEEE specification and IS-64 criterion of EIA standard is indicated by the "computer design" magazine (Dempa Shimbun, the July, 1991 issue, the 55th page Fig. 8). This female connector adjoins and arranges two or more female connectors in a request location to male form contact of a large number arranged in the same pitch for example, on a substrate, and it can connect female form contact, without producing futility in male form contact.

[0003] In the above-mentioned female connector, as shown in drawing 12, contact 204 is held in each of two or more through holes 202 mutually installed in the opposite edge face-to-face of the electric insulation body 200 by abbreviation parallel by rectangular grid-like arrangement fixed. Each contact 204 is equipped with the pressure-welding section 206 which carries out the pressure welding of the covering lead wire W of Cable C to an end, and equips male form contact of correspondence in the other end with the contact section 208 which carries out flow contact. By having the piece 212 of a pressure welding of two sheets installed in the crossing direction of contact 204 in preparation for each in the open slit 210, and pressing the covering lead wire W fit in these slits 210, the piece 212 of a pressure welding pierces into pre-insulation, and the pressure-welding section 206 contacts lead wire. In addition, generally such a press fit connection type is called a "pressure welding."

[0004] JP,63-9771,U indicates the connector equipped with the lead-wire attachment component 222 which holds two or more covering lead wire W in Cable C in the mutual isolation condition, and is attached in the connector body 220 for high density connection. As shown in drawing 13, the lead-wire attachment component 222 is mutually constituted combining the 2nd covering 236 with two or more retention groove 234 which intersects two or more crevices 232 arranged corresponding to the penetration cut 228 of the 1st covering 230 with two or more penetration cuts 228 which insert the pressure-welding section 226 of contact 224, and the 1st covering 230, and these crevices 232, and is prolonged. Two or more contact 224 turns the plate surface of the pressure-welding section 226 to the longitudinal direction of a connector, and is arranged in the shape of a hound's-tooth check, and corresponding to it, in this connector, the penetration cut 228 of the 1st covering 230 and the crevice 232 of the 2nd covering 236 all extend in the shape of a straight line in a covering longitudinal direction, and are arranged in the shape of a hound's-tooth check by it. Each retention groove 234 of the 2nd covering 236 is prolonged in the covering crossing direction, and intersects perpendicularly with each crevice 232.

[0005] The opening 238 prepared in the 2nd covering 236 lets two or more covering lead wire W of Cable C pass, they is isolated mutually, and is arranged in each retention groove 234. In the condition, two or more covering lead wire W is held fixed by attaching the 1st covering 230 to the 2nd covering 236 at two or more retention groove 234. If this

lead-wire attachment component 222 is attached in the connector body 220, the pressure-welding section 226 of each contact 224 will be inserted in the penetration cut 228 of the 1st covering 230 and the crevice 232 of the 2nd covering 236, and a pressure welding will be carried out to the covering lead wire W held at each retention groove 234.

[0006]

[Problem(s) to be Solved by the Invention] In order to be able to carry out the pressure welding of the covering lead wire to the piece of a pressure welding of two sheets extended in the crossing direction of each contact held in the through hole of a body, the above-mentioned female connector indicated by the "computer design" magazine is arranged at the train from which long contact and short length contact differ, and is exposed in the location where the pressure-welding section of contact from which these die length differs shifted to the longitudinal direction mutually. Therefore, in this connector, it originates in the difference of the dimension (die length) of contact, the propagation durations of a signal differ between the signal-line ways in a connector, and the technical problem to which it becomes difficult to aim at adjustment of the travelling period between other communication circuit components arises. Moreover, since the slit of the pressure-welding section of two or more contact is prolonged in the same crossing direction in the location [longitudinal direction] shifted, it is difficult to put in block two or more covering lead wire of a cable to all contact, and to carry out a pressure welding to coincidence, and has the problem which requires time and effort for a pressure-welding activity. Furthermore, since it is exposed also where the pressure welding of the lead wire is carried out, a fear of changing a pressure-welding condition arises, and the pressure-welding section of contact has a technical problem inferior to the dependability of flow contact, when external force joins the pressure-welding section and lead wire.

[0007] On the other hand, by having used the lead-wire attachment component, the connector indicated by JP,63-9771,U can bundle up two or more covering lead wire of a cable, and they can carry out a pressure welding to coincidence. However, in this connector, since contact is arranged in the shape of a hound's-tooth check in order to prevent the short circuit between signal-line ways, compared with the case where contact of the same number is arranged in the shape of a rectangular grid, the dimension of a connector will be expanded in the contact array direction. In the exchange or a transmission device, although it is indispensable to arrange a signal-line way in the shape of a rectangular grid in order to promote much more densification of a signal-line way, this connector cannot respond to connection of such high density.

[0008] Therefore, in the connector for high density connection which has arranged two or more contact in the shape of a rectangular grid, the purpose of this invention can use . contact of the same dimension (especially the same die length), bundles up two or more covering lead wire of a cable to all contact, can carry out a pressure welding to coincidence, and is to offer the connector excellent in the connection dependability which can moreover avoid the effect of the external force to the pressure-welding section or lead wire. Other purposes of this invention are to offer contact used for such a connector.

[0009]

[Means for Solving the Problem] The body of the electric insulation which equipped abbreviation parallel with two or more through holes to which this invention extends in the opposite edge face-to-face of a pair in order to attain the above-mentioned purpose by rectangular grid-like arrangement mutually, In the connector for high density connection

possessing two or more conductive contact which equip each end with the pressure-welding section which carries out the pressure welding of the electric wire, and the pressure-welding section is made to project from the end side of a body, and is held in the through hole of a body fixed, respectively Two or more electric wires are held in the mutual insulation condition, it is attached in the end side of a body, and the connector for high density connection possessing the attachment component of the electric insulation which carries out the pressure welding of these electric wires to the pressure-welding section of two or more contact collectively is offered. This attachment component is mutually constituted combining the 1st maintenance plate and the 2nd maintenance plate. Opening by which penetration formation of the 1st maintenance plate is carried out between the 1st back face, and the 1st back face and its rear face, Two or more 1st pinching **** by which mutually-independent is carried out between the periphery of opening, and the rim of the 1st maintenance plate on the 1st back face, it is installed in the various directions, and at least a part is arranged from the periphery of opening at an abbreviation radial, The 1st pinching **** is intersected, and it is engraved on every one each of the 1st pinching ****, and has two or more 1st acceptance sections which carry out mutually-independent on the 1st back face, and are arranged in the shape of a rectangular grid. Two or more 2nd pinching **** which the 2nd maintenance plate is installed that it should have consistency in two or more 1st pinching **** of the 1st maintenance plate on the 2nd back face which counters the 1st back face of the 1st maintenance plate, and the 2nd back face, collaborate with the 1st pinching ****, and pinch an electric wire between both pinching ****, Every one each of the 2nd pinching **** is intersected at the 2nd pinching ****, penetration formation is carried out between the 2nd back face and its rear face, and it has two or more 2nd acceptance sections arranged in the shape of a rectangular grid that it should have consistency in two or more 1st acceptance sections of the 1st maintenance plate. Two or more contact is in the condition which rotated each pressure-welding section at various include angles which can intersect perpendicularly with two or more 2nd pinching **** of correspondence of the 2nd maintenance plate around the axis of contact, and is held in two or more through holes of a body. And while the 2nd maintenance plate is attached in an attachment component by the body in contact with the end side of a body, and two or more 2nd acceptance sections of the 2nd maintenance plate are overlapped on two or more through holes arranged in the shape of a rectangular grid at the body, respectively and are arranged at this time The pressure-welding section of two or more contact is received by two or more 2nd acceptance sections of the 2nd maintenance plate, respectively, and a pressure welding is carried out to the electric wire pinched between the 1st pinching **** and the 2nd pinching **** in the state of a rectangular cross.

[0010] The connector for high-density connection which this invention furthermore consists of the 1st cut to which the 1st acceptance section of the 1st maintenance plate carries out an abbreviation rectangular cross in the extended direction of the 1st pinching ****, and extends in the shape of a straight line in the above-mentioned connector for high density connection, and becomes from the 2nd cut to which the 2nd acceptance section of the 2nd maintenance plate carries out an abbreviation rectangular cross in the extended direction of the 2nd pinching ****, and extends in the shape of a straight line provides. The connector for high-density connection arranged by having the supporter which is furthermore formed between the pressure-welding section by which, as for this

invention, two or more contact was formed in the end in the above-mentioned connector for high density connection, the contact section formed in the other end, and the pressure-welding section and the contact section, is contacted by the wall of the through hole of a body, and supports contact itself in a through hole, and the pressure-welding section inclining to a supporter is offered.

[0011] Furthermore, this invention offers the connector for high density connection in which two or more contact contains the group of two kinds of contact which only the same include angle bends the pressure-welding section to an opposite direction, and is formed to a supporter in the above-mentioned connector for high density connection.

[0012] The pressure-welding section which is contact used for the above-mentioned connector for high density connection, and was furthermore formed in the end according to this invention, It is formed between the contact section formed in the other end that other conductive contact should be contacted, and the pressure-welding section and the contact section. Have the supporter which is contacted by the wall of the through hole of a body and supports contact itself in a through hole, and the pressure-welding section rotates at a request include angle around the axis of contact. Contact characterized by being inclined and arranged to a supporter in the location which makes at least a part project outside the outside surface of a supporter is offered.

[0013]

[Embodiment of the Invention] Hereafter, with reference to an accompanying drawing, this invention is explained to a detail based on the operation gestalt. When a drawing is referred to, drawing 1 shows the principal part of the connector 10 by 1 operation gestalt of this invention with a decomposition perspective view. A connector 10 is equipped with the lead-wire attachment component 16 which carries out separation maintenance of two or more covering lead wire W of two or more contact 14 by which insulating support is carried out, and the cable C connected to contact 14, and is attached in the predetermined location of a body 12 and a body 12 at a body 12.

[0014] A body 12 is housing of the abbreviation rectangular parallelepiped configuration which consists of electric insulators, such as plastics, and is equipped with two or more through holes 22 mutually prolonged in abbreviation parallel by rectangular grid-like arrangement of four-line six trains between the front end sides 18 and the back end sides 20 where an abbreviation rectangle flat-surface configuration counters. Two or more through holes 22 are arranged so that each may have the same rectangle cross-section configuration and the wall surface of each through hole 22 may become parallel to the peripheral face of a body 12, and so that the correspondence wall surface of the ***** through hole 22 may become parallel to mutual. In the front end side 18 of a body 12, the taper-like peripheral surface 24 is formed in opening of each through hole 22, and the contact section (it mentions later) of contact 14 is arranged in the inner part of [inner] a peripheral surface 24. The body 12 which has such a configuration is applicable to the female connector which can apply to the connector which can respond to connection of high density by the exchange, a transmission device, etc., for example, is equipped with two or more contact by the rectangular grid-like arrangement of 2mm pitch based on 1301.P1 criterion of IEEE specification, and IS-64 criterion of EIA standard.

[0015] From a flat conductive metal plate, it pierces and contact 14 is formed, as shown in drawing 2 . The leg 28 of a pair extended in parallel [from / near the both ends of the merits side of the rectangle base 26 of the center of abbreviation, and the rectangle base

26] with mutual by contact 14 of a blanking configuration, The arm 30 extended from the center of the other long sides of the rectangle base 26 in the opposite direction of the leg 28, It has the rectangle supporter 32 connected at the tip of an arm 30 by having a side extension, the connection section 34 installed in the opposite side of an arm 30 from the rectangle supporter 32, and the pressure-welding section 36 which estranges slightly from the rectangle supporter 32 and is connected with the connection section 34. The contact section 38 is formed at the tip of the leg 28 of a pair, and a pawl 40 protrudes on the opposite side of the side extension of the rectangle supporter 32. The pressure-welding section 36 is equipped with the cutting edge 42 of a pair installed in the longitudinal direction of contact 14, and the open slit 44 prolonged in parallel with the extended direction of an arm 30 among these cutting edges 42 is formed.

[0016] In a connector 10, two kinds of contact 14a and 14b which can bend and form contact 14 of the blanking configuration shown in drawing 2 in the different direction is used. as shown in drawing 3 (a), while contact 14a bends the base 26 of contact 14 at an abbreviation right angle at a valley fold type about the broken lines 46 and 48 shown in drawing 2 -- a supporter 32 -- a broken line 50 -- being related -- a valley fold type -- an abbreviation right angle -- bending -- further -- the pressure-welding section 36 -- a broken line 52 -- being related -- a valley fold type -- and it is preferably bent and formed in the include angle alpha of 115 degrees - 120 degrees to the front face of a part where a supporter 32 was not bent. As shown in drawing 3 (b), moreover, contact 14b While bending the base 26 of contact 14 at an abbreviation right angle at a mountain fold type about the broken lines 46 and 48 shown in drawing 2 , a supporter 32 is bent at an abbreviation right angle about a broken line 50 at a mountain fold type. further -- the pressure-welding section 36 -- a broken line 52 -- being related -- a mountain fold type -- and it is preferably bent and formed in the include angle alpha of 115 degrees - 120 degrees to the front face of a part where a supporter 32 was not bent.

[0017] Thus, curved contact 14a and 14b serves as a configuration which the pressure-welding section 36 inclined to the side extension of the rectangle supporter 32, and each projected partially at least on the outside of a side extension. Furthermore, the contact section 38 of a pair is curved so that mutual estrangement may be gradually carried out toward a tip, so that the leg 28 of the pair of Contact 14a and 14b may carry out mutual approach gradually toward a tip. Thereby, the contact section 38 of a female form in which the flow contact to other male form contact is possible is constituted.

[0018] As shown in drawing 4 and drawing 5 , two or more contact 14a and 14b divides two or more through holes 22 of the body 12 of a connector 10 equally in two-line four every three trains groups according to the class and the installation direction of Contact 14a and 14b which are installed in them, and is installed in the through hole 22 of each group as follows. That is, those rectangle supporters 32 and the pressure-welding section 36 are arranged at the top-face 54 side of a body 12, and make and insert contact 14a in six through holes 22 of a group shown in the upper left in respect of [20] the back end of a body 12 by a diagram, respectively. Moreover, those rectangle supporters 32 and the pressure-welding section 36 are arranged at the inferior-surface-of-tongue 56 side of a body 12, and make and insert contact 14a in six through holes 22 of a group shown in the lower right in respect of [20] the back end of a body 12 by a diagram, respectively.

[0019] Furthermore, those rectangle supporters 32 and the pressure-welding section 36 are arranged at the top-face 54 side of a body 12, and make and insert contact 14b in six

through holes 22 of a group shown in the upper right in respect of [20] the back end of a body 12 by a diagram, respectively. Moreover, those rectangle supporters 32 and the pressure-welding section 36 are arranged at the inferior-surface-of-tongue 56 side of a body 12, and make and insert contact 14b in six through holes 22 of a group shown in the lower left in respect of [20] the back end of a body 12 by a diagram, respectively.

[0020] Thus, while all contact 14a and 14b turns the contact section 38 of those pairs to a top-face [of a body 12] 54, and inferior-surface-of-tongue 56 side and is arranged within a through hole 22, those pressure-welding sections 36 are made to project from the back end side 20 of a body 12 to the method of outside, and among four through hole groups divided equally, they makes the pressure-welding section 36 incline in a mutually different location, and is arranged. The rectangle base 26, an arm 30, and the rectangle supporter 32 are contacted by the wall of a through hole 22, and each contact 14a and 14b inserted in each through hole 22 is supported fixed by the predetermined location in a through hole 22, when a pawl 40 engages with the wall of a through hole 22 further.

[0021] Moreover, if Contact 14a and 14b is arranged in the predetermined location in a through hole 22, the base 58 of the inclined pressure-welding section 36 will be contacted by the shoulder 60 prepared in the wall of a through hole 22 in respect of [about 20] the back end of a body 12. Consequently, the thrust at the time of carrying out the pressure welding of the cable lead wire to the pressure-welding section 36 of contact is caught by the shoulder 60 of a body 12, and the deformation and breakage of contact of the connection section 34 by thrust are prevented.

[0022] As shown in drawing 6 - drawing 8 , the lead-wire attachment component 16 is mutually constituted combining the 1st maintenance plate 62 and the 2nd maintenance plate 64 which all consist of electric insulators, such as plastics. The 1st maintenance plate 62 is equipped with the 1st back face 66 of the abbreviation rectangle flat-surface configuration corresponding to the back end side 20 of a body 12. Between the 1st back face 66 and the rear face 68 of the opposite side, penetration formation of the opening 70 prolonged [to / from one rim of the 1st maintenance plate 62 which constitutes a rectangular opposite shorter side / near the rim of another side] in the longitudinal direction of the 1st maintenance plate 62 through the abbreviation core of the 1st back face 66 is carried out.

[0023] 1st pinching **** 76 of plurality (24 pieces) extended between the periphery 72 of opening 70 and the rim 74 of the 1st maintenance plate 62 is formed in the 1st back face 66 independently so that it may not cross mutually. These 1st pinching **** 76 is equally divided by four groups which incline in the different direction from the periphery 72 of opening 70, and are prolonged. Two or more 1st pinching **** 76 distributed to four groups are prolonged in the symmetry about opening 70, and six 1st pinching **** 76 are mutually prolonged in parallel within each group. Moreover, two groups arranged to opening 70 at a same side are equipped with 1st pinching **** 76 mutually prolonged in axial symmetry so that mutual spacing may be gradually extended toward the rim 74 of the 1st maintenance plate 62 from the periphery 72 of opening 70. Thus, all 1st pinching **** 76 are arranged focusing on opening 70 on the 1st back face 66 at an abbreviation radial.

[0024] Each 1st pinching **** 76 has the configuration of the slot which forms a wall 78 between adjoining 1st pinching **** 76, and a part for the part 80 with a comparatively shallow bottom, the part 82 with a comparatively deep bottom, and the slant surface part

84 that connects both the parts 80 and 82 of each other is prepared in each slot. Between adjoining 1st pinching **** 76, the part 80 with a comparatively shallow bottom and the part 82 with a comparatively deep bottom are arranged in a mutual location. In addition, only the part 80 with a comparatively shallow bottom is formed in 1st pinching **** 76 (especially sign 76' shows) arranged at the outer edge and inner edge of each group. Moreover, in order to make arrangement of the covering lead wire W easy to 1st pinching **** 76 of an inner edge, opening 70 is extended in the crossing direction of the 1st back face 66.

[0025] And the 1st cut 86 which carries out an abbreviation rectangular cross one [at a time] in the extended direction of 1st pinching **** 76 at each of 1st pinching **** 76, and is prolonged in the shape of a straight line is engraved on the part 80 with a comparatively shallow bottom by the request depth. These 1st cuts 86 are arranged independently in the shape of a rectangular grid on the 1st back face 66, without crossing mutually. Two or more 1st cuts 86 receive to each the pressure-welding section 36 of two or more contact 14 held in the body 12, and correspond to rectangular grid-like arrangement of two or more contact 14 which can set the rectangular grid-like arrangement on a body 12 so that it may mention later. Moreover, two or more 1st cuts 86 are inclined and prolonged at the include angle corresponding to the inclination of the pressure-welding section 36 to the rim 74 of the 1st maintenance plate 62. That is, the include angle α of the arm 30 of contact 14 and the pressure-welding section 36 to accomplish corresponds to the obtuse angle of the rim 74 (especially sign 74' shows) by the side of the shorter side of the 1st maintenance plate 62, and the 1st cut 86 to accomplish.

[0026] The 2nd maintenance plate 64 is equipped with the 2nd back face 88 of the abbreviation rectangle flat-surface configuration corresponding to the back end side 20 of a body 12. The 1st back face 66 of the 1st maintenance plate 62 is countered, mutual engagement is carried out, and the 2nd back face 88 has in the center a part for the flat surface part 90 superimposed on the opening 70 of the 1st maintenance plate 62, when the 1st maintenance plate 62 and the 2nd maintenance plate 64 are combined.

[0027] Corresponding to two or more 1st pinching **** 76 of the 1st maintenance plate 62, 2nd pinching **** 96 of plurality (24 pieces) extended between the periphery 92 for a flat surface part 90 and the rim 94 of the 2nd maintenance plate 64 is formed in the 2nd back face 88 independently so that it may not cross mutually. These 2nd pinching **** 96 is equally divided by four groups which incline in the different direction from the periphery 92 for a flat surface part 90 like 1st pinching **** 76, and are prolonged. Two or more 2nd pinching **** 96 distributed to four groups are prolonged in the symmetry about a part for a flat surface part 90, and six 2nd pinching **** 96 are mutually prolonged in parallel within each group. Moreover, two groups arranged to a part for a flat surface part 90 at a same side are equipped with 2nd pinching **** 96 mutually prolonged in axial symmetry so that mutual spacing may be gradually extended toward the rim 94 of the 2nd maintenance plate 64 from the periphery 92 for a flat surface part 90. Thus, all 2nd pinching **** 96 are arranged focusing on a part for a flat surface part 90 on the 2nd back face 88 at an abbreviation radial.

[0028] every -- 2nd pinching **** 96 -- every -- a part for a part for the projection part 98 inserted in the part 82 with a comparatively deep bottom of 1st pinching **** 76 and the slot 100 which counters the part 80 with a comparatively shallow bottom, and the

slant surface part 102 which connects both the parts 98,100 of each other is formed. Between adjoining 2nd pinching **** 96, a part for the projection part 98 and a slot 100 is arranged in a mutual location. In addition, only a part for a slot 100 is formed in 2nd pinching **** 96 (especially sign 96' shows) arranged at the outer edge and inner edge of each group.

[0029] When the 2nd maintenance plate 64 and the 1st maintenance plate 62 are combined, Clearance G is formed between 2nd pinching **** 96 and 1st pinching **** 76, and the covering lead wire W of Cable C is pinched by this clearance G. Since both pinching **** 76 and 96 has a level difference and is prolonged at this time, the covering lead wire W is held fixed by friction in Clearance G. Moreover, both the maintenance plates 62 and 64 of each other are restrained about migration in a longitudinal direction by inserting the projection part 98 of 2nd pinching **** 96 in the part 82 with a comparatively deep bottom of 1st pinching **** 76. Furthermore, both the maintenance plates 62 and 64 of each other are also fixable by designing so that the projection part 98 may be densely inserted in the part 82 with a comparatively deep bottom.

[0030] The 2nd cut 104 which carries out an abbreviation rectangular cross one [at a time] in the extended direction of 2nd pinching **** 96 at each of 2nd pinching **** 96, and is prolonged in the shape of a straight line penetrates between the 2nd back face 88 and the rear faces 106 of the opposite side, and is engraved on a part for a slot 100. These 2nd cuts 104 are arranged independently in the shape of a rectangular grid on the 2nd back face 88 that it should have consistency in two or more 1st cuts 86 of the 1st maintenance plate 62, without crossing mutually. Two or more 2nd cuts 104 collaborate with two or more 1st cuts 86, receive to each the pressure-welding section 36 of two or more contact 14 held in the body 12, and correspond to rectangular grid-like arrangement of two or more contact 14 which can set the rectangular grid-like arrangement on a body 12 so that it may mention later. Moreover, two or more 2nd cuts 104 are inclined and prolonged at the include angle corresponding to the inclination of the pressure-welding section 36 to the rim 94 of the 2nd maintenance plate 64. That is, the include angle alpha of the arm 30 of contact 14 and the pressure-welding section 36 to accomplish corresponds to the obtuse angle of the rim 94 (especially sign 94' shows) by the side of the shorter side of the 2nd maintenance plate 64, and the 2nd cut 104 to accomplish.

[0031] In case the covering lead wire W of Cable C is made to hold to the lead-wire attachment component 16, as first shown in drawing 6 , two or more covering lead wire W is inserted in opening 70 from the rear-face 68 side of the 1st maintenance plate 62, these covering lead wire W of each other is separated, and it arranges along with 1st pinching **** 76, respectively. At this time, the tip of each lead wire W projects from the rim 74 of the 1st maintenance plate 62 preferably. Combination, 1st pinching **** 76, and 2nd pinching **** 96 are made for the 2nd maintenance plate 64 to engage with the 1st maintenance plate 62, and the covering lead wire W is made to pinch between both pinching **** 76 and 96 in the condition. Thus, two or more covering lead wire W is held within the lead-wire attachment component 16 at a mutual insulation condition. In addition, the surplus part of the covering lead wire W projected from the rim 74 of the 1st maintenance plate 62 is preferably excised in this condition.

[0032] The lead-wire attachment component 16 holding the covering lead wire W makes the rear face 106 of the 2nd maintenance plate 64 counter the back end side 20 of a body 12, as shown in drawing 1 , and it is attached in the back end side 20 of a body 12,

inserting in two or more 2nd cuts 104 of the 2nd maintenance plate 64 the pressure-welding section 36 of two or more contact 14 supported by the body 12. At this time, by inserting the pressure-welding section 36 of two or more contact 14 in two or more 2nd cuts 104 of the 2nd maintenance plate 64 under a predetermined pressure, the pre-insulation of the covering lead wire W with which the double-edged sword 42 of each pressure-welding section 36 was pinched between 1st pinching **** 76 and 2nd pinching **** 96 is pierced into, lead wire is inserted in a slit 44 in the state of a rectangular cross, and an electric conduction contact condition is acquired. In this condition, a part for the point of the double-edged sword 42 of each pressure-welding section 36 is received by cut 86 for a start [of the 1st maintenance plate 62]. Thus, if the pressure welding of two or more covering lead wire W is carried out to two or more contact 14, the lead-wire attachment component 16 will be attached in a body fixed.

[0033] Further, a connector 10 can be equipped with the outline member 108 which carries out covering protection of the covering lead wire W exposed at the terminal of the lead-wire attachment component 16 and Cable C which were attached in the body 12, as shown in drawing 9 and drawing 10 . It is equipped with the upper wall 114 and low wall 116 which engage with each boss 112 of the top face 54 of a body 12, and an inferior surface of tongue 56, and where Cable C is inserted in the main opening 110, a body 12 is equipped with it fixed, while the outline member 108 is equipped with the main opening 110 which inserts in Cable C. At this time, the shoulder 118 prepared in the inside of the outline member 108 is contacted by the rear face 68 of the 1st maintenance plate 62 of the lead-wire attachment component 16, and, thereby, the lead-wire attachment component 16 is fixed to a body 12 still more firmly.

[0034] Thus, in a connector 10, by having used the lead-wire attachment component 16, two or more covering lead wire W of Cable C can be put in block to two or more contact 14 of the same dimension by which high density arrangement was carried out at the shape of a rectangular grid at the body 12, and a pressure welding can be carried out to them at coincidence. Moreover, since the contact part of the pressure-welding section 36 of contact 14 and the covering lead wire W is covered by a pressure welding and coincidence inside the lead-wire attachment component 16 and the covering lead wire W is moreover held fixed between the first maintenance plate 62 and the second maintenance plate 64, a fear of changing a pressure-welding condition under the effect of external force is avoided, and the connection dependability of a connector 10 improves.

[0035] in addition , the configuration make to incline as the 1st and 2nd cuts 86,104 be described above to the alignment direction of contact 14 in the pressure welding section 36 of contact 14 , 1st and 2nd pinching **** 76 of the lead wire attachment component 16 , and 96 lists be indispensable in order to put the covering lead wire W in block to the shape of a rectangular grid reasonable and to be able to carry out the pressure welding of it to it in the mutual insulation condition at two or more contact 14 by which high density arrangement be carried out . The suitable range of 115 degrees - 120 degrees of alpha is range which can expand most the diameter size method of the covering lead wire W in which a pressure welding is possible to contact 14 whenever [tilt-angle / which was mentioned above]. Moreover, since 1st and 2nd pinching **** 76 and 96 and the 1st and 2nd cuts 86,104 intersect perpendicularly mutually and are prolonged, the pressure welding of the front face of the cutting edge 42 of the pressure-welding section 36 of contact 14 and the covering lead wire W is carried out in the state of a rectangular cross.

Consequently, in case lead wire is inserted in a slit 44, the inconvenient bending stress and the shearing stress which join lead wire are reduced, and the further excellent connection dependability is acquired.

[0036] The connector concerning this invention is not limited to the above-mentioned operation gestalt, and two or more kinds of contact from which the inclination direction of the pressure-welding section differs can be used for it in combination other than the above. When it corrects, for example, the inclination direction of the pressure-welding section 36 of all contact 14 is made the same in a connector 10, in order that 1st and 2nd pinching **** 76 and 96 of the lead-wire attachment component 16 may also make it incline in the same direction altogether and may pinch all the covering lead wire W certainly in this case, the lead-wire attachment component 16 must be extended to a longitudinal direction, and the formation space of both pinching **** 76 and 96 must be secured. The useless space which cannot arrange contact 14 is generated in a connector 10, and it becomes impossible consequently, for that contiguity arrangement can be carried out continuously to apply the connector which has the same configuration as the direction of a side face of a body 12 to the connector for high density connection demanded, maintaining the pitch of contact equally. Therefore, it is the conditions which can eliminate such un-arranging, and it is important to set up the combination of two or more kinds of contact.

[0037] Drawing 11 roughly shows the example of various configurations of various combination of two or more kinds of contact applicable to the connector for high density connection, and the lead-wire attachment component corresponding to it. Drawing 11 (a) shows body 12' which installed above-mentioned contact 14a and 14b in nine through hole 22' arranged in the shape of [of three line three trains] a rectangular grid, respectively from the back end side 20'. In this case, nine through hole 22' is divided into four groups according to the class and the installation direction of Contact 14a and 14b which are installed in them. In drawing, contact 14a turns those pressure-welding sections 36 to the top-face 54' side of body 12', and is installed in upper left two through hole 22', respectively. Moreover, contact 14a turns those pressure-welding sections 36 to the inferior-surface-of-tongue 56' side of body 12', and is installed in lower right two through hole 22', respectively. Furthermore, contact 14b turns the pressure-welding section 36 to the top-face 54' side of body 12', and is installed in upper right one through hole 22'. Moreover, contact 14b turns those pressure-welding sections 36 to the inferior-surface-of-tongue 56' side of body 12', and is installed in lower left four through hole 22', respectively.

[0038] Drawing 11 (b) shows 1st maintenance plate 62' of the lead-wire attachment component attached to body 12' with such contact arrangement from 1st back-face 66'. Between 1st back-face 66' and the rear faces of 1st maintenance plate 62', penetration formation of opening 70' which while counters and is prolonged [to / from a rim / near the rim of another side] is carried out. Corresponding to the pressure-welding section 36 of two or more contact 14 of body 12', two or more 1st cut 86' which inclines respectively and is arranged in the shape of a rectangular grid is prepared in 1st back-face 66'. Furthermore, it intersects perpendicularly with each 1st cut 86', and two or more 1st pinching **** 76' extended between periphery 72 of opening 70' and rim 74 of 1st maintenance plate 62' is formed independently so that it may not cross mutually. These 1st pinching **** 76' is arranged focusing on opening 70' on 1st back-face 66' at an

abbreviation radial. It cannot be overemphasized that the same effectiveness as the above-mentioned operation gestalt is acquired also by such configuration.

[0039] drawing 11 -- (-- c --) -- being shown -- an example -- drawing 11 -- (-- a --) -- being the same -- three -- a line -- three -- trains -- a rectangle -- a grid -- ** -- arranging - - having had -- nine -- a piece -- a through hole -- 22 -- " -- having -- a body -- 12 -- " -- receiving -- the above-mentioned -- contact -- 14 -- a -- 14 -- b -- further -- differing -- a configuration -- contact -- 14 -- c -- installing . In this case, 22" of nine through holes is divided into three groups according to the class and the installation direction of Contact 14a, 14b, and 14c which are installed in them. In addition, the pressure-welding section 36 of Contact 14a and 14b does not incline, and contact 14c can be similarly formed from contact 14 of the blanking configuration of drawing 2 . In drawing, contact 14c turns those pressure-welding sections 36 to a side 54" of top faces of 12" of bodies, and is installed in 22" of three upper through holes, respectively. Moreover, contact 14a turns those pressure-welding sections 36 to a side 56" of inferior surfaces of tongue of 12" of bodies, and is installed in 22" of two lower right through holes, respectively.

Furthermore, contact 14b turns those pressure-welding sections 36 to a side 56" of inferior surfaces of tongue of 12" of bodies, and is installed in 22" of four lower left through holes, respectively.

[0040] Drawing 11 (d) shows the 62" of the 1st maintenance plates of the lead-wire attachment component attached to 12" of bodies with such contact arrangement from the 66" of the 1st back face. the -- one -- maintenance -- a plate -- 62 -- " -- **** -- drawing 11 -- (-- b --) -- the -- one -- maintenance -- a plate -- 62 -- ' -- being the same -- opening - - 70 -- " -- penetration -- formation -- carrying out -- having . the -- one -- a back face -- 66 -- " -- **** -- a body -- 12 -- " -- plurality -- contact -- 14 -- a pressure welding -- the section -- 36 -- corresponding -- respectively -- inclining -- or -- not inclining -- a ** -- a rectangle -- a grid -- ** -- arranging -- having -- plurality -- the -- one -- a cut -- 86 -- " -- preparing -- having . furthermore -- every -- the -- one -- a cut -- 86 -- " -- intersecting perpendicularly -- opening -- 70 -- " -- a periphery -- 72 -- " -- the -- one -- maintenance -- a plate -- 62 -- " -- a rim -- 74 -- " -- between -- extending -- having -- plurality -- the -- one -- pinching -- **** -- 76 -- " -- mutual -- not crossing -- as -- becoming independent - - forming -- having .

[0041] The 76" of the 1st pinching **** arranged among the 76" of these 1st pinching **** at the lower part part of 70" of openings of the 66" of the 1st back face is arranged focusing on 70" of openings the 66" of the 1st back face in a top at an abbreviation radial. Moreover, the 66" of the 1st back face, the 76" of the 1st pinching **** arranged at the upper part part of 70" of openings of the 66" of the 1st back face carries out an abbreviation rectangular cross, and they are arranged [in a top] at 72" of peripheries of 70" of openings. Thus, when two or more through holes of a body are divided into two or more groups according to the class and the installation direction of contact which are installed in them and one group can be constituted from a group which aligns only in one train, contact of the group does not make the pressure-welding section incline, but ** can also carry out the pressure welding of the covering lead wire of a cable to the pressure-welding section good in the state of a rectangular cross.

[0042] Thus, can apply this invention to the connector which has arranged two or more contact in the shape of [three line / of three or more trains] a rectangular grid, and these contact is divided into at least 3 groups according to the inclination gestalt of the

pressure-welding section. Package connection of two or more lead wire is enabled by arranging pinching **** of at least 1 group of the lead-wire attachment component corresponding to a contactor group from an opening periphery to an abbreviation radial to a rim so that the pressure welding of two or more covering lead wire can be carried out to the pressure-welding section of contact of each group in the state of a rectangular cross. In such a viewpoint, each cut of a lead-wire attachment component can adopt all the configurations that can receive the pressure-welding section of not only the configuration of an illustration implementation gestalt but contact. And contact from which whenever [tilt-angle / of the pressure-welding section / all] differ, and the lead-wire attachment component from which whenever [tilt-angle / of pinching **** / all] differ corresponding to it can also be used for the connector concerning this invention. Moreover, if this invention is contact which made the include angle of a request of the pressure-welding section around the axis of contact rotate thru/or incline Not only in contact 14 with the contact section 28 of two sheets shown in the above-mentioned operation gestalt It is applicable to the female connector or male connector which can use female form contact with the contact section of one sheet, and male form contact with the pin-like contact section, therefore has a body corresponding to the configuration of such contact.

[0043]

[Effect of the Invention] In the connector for the high density connection whose this invention has arranged two or more contact in the shape of a rectangular grid so that clearly from the above explanation It makes it possible to avoid the effect of the external force to the lead wire by which bundled up two or more covering lead wire of a cable to all contact that used contact of the same dimension especially in the die-length direction, and was held in the connector body, and carried out the pressure welding to coincidence, and the pressure welding was moreover carried out to the pressure-welding section and the pressure-welding section of contact as much as possible. Furthermore, this invention offers contact used for such a connector for high density connection. Therefore, according to this invention, the connector for high density connection of the high performance which raised the connection dependability of contact inside a connector and an electric wire is offered.
